

OBSERVATIONS OF PREDATION ON ALATE QUEENS OF THE
RED IMPORTED FIRE ANT (HYMENOPTERA: FORMICIDAE)
BY THE BLACK AND YELLOW GARDEN SPIDER (ARANEAE:
ARANEIDAE)

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There are a number of published records of predation on the newly mated queens of the red imported fire ant, *Solenopsis invicta* Buren, including attacks on founding queens by numerous insectivorous predators (Edwards et al. 1974, Glancey 1981, Lucas & Brockman 1981, Nichols & Sites 1991). Whitcomb et al. (1973) listed 22 vertebrate and invertebrate predators. Among these, only one spider *Lycosa timuga* Wallace was observed feeding on founding queens. Nyfeller et al. (1988) collected the remains of 34 *S. invicta* queens from the webs of 100 *Latrodectus mactans* (F.) spiders in cotton fields. Red imported fire ant queens made up over 15% of the total prey of *L. mactans*. In the same study, 16 additional spiders from eight families were listed as predators of red imported fire ants. Of these, only two (*Neoantistea* sp. and *Phidippus audax*) were observed with *S. invicta* queens as prey.

Beginning at 1015 hours on 23 August 1990, a single black and yellow garden spider, *Argiope aurantia* Lucas, was observed capturing alate red imported fire ant females in flight. The spider, a penultimate female, had established her vertical web approximately 1.0 m (at its center) above and 1.0 m to the northeast of an active *S. invicta* mound [category 9 on the Lofgren & Williams (1982) scale]. The spiraled area of the web covered an area of approximately 0.8 m. Prevailing winds placed the spider's web directly downwind of the mound. Alate females were seen emerging from the colony, ascending adjacent plants (primarily wild grasses and a wild sparkelberry bush *Vaccinium arboreum* Marsh.) before launching themselves into the air. During a period of 30 min, 275 alate females were observed leaving the mound by flight. During this same period, the garden spider snared 37 ants. For the first twelve min of this activity, the spider reacted to the arrival of the alate females by rushing to the point of web contact and quickly subduing the prey by swathing it with silk. Twenty-four of the alates were handled in this manner. Nine of these were first envenomated by the spider before swathing. The remaining 15 were either bitten after swathing or, as was the case for the last 5 taken, merely swathed without a bite. The final 13 alates to contact the web were handled differently from the first twenty-four. The spider reacted by jerking the web to dislodge the prey (n=5). Failing to dislodge the prey, the spider would cautiously approach the captured queen and carefully sever the lines to which the ant was attached to the web allowing it to drop from the web to the ground strata (n=8). Ants that were shaken from the web climbed an adjacent plant and again took flight (one of which was again caught in the web). Those alates severed from the web were unable to regain flight and, upon closer examination, were found to have webbing attached to their wings and body.

Research into biological control of imported fire ants has concentrated on pathogens and parasitoids almost to the exclusion of generalist predators (Allen 1980, Jouvenaz 1983, Jouvenaz et al. 1980, Williams 1980, Williams & Whitcomb 1974). Although only a single observance, a 15% reduction by a spider in alate females reported here may represent a more widespread and frequent phenomena. Further study of the potential of such generalist predators as biocontrol agents of *S. invicta* should be encouraged.

SUMMARY

The serendipitous placement of an *Argiope aurantia* web in the direct flight path of emerging alate fire ants succeeded in disrupting the mating flight of approximately 15% of the observed queens, either through direct predation or indirectly by hampering their ability to fly (capture and release).

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